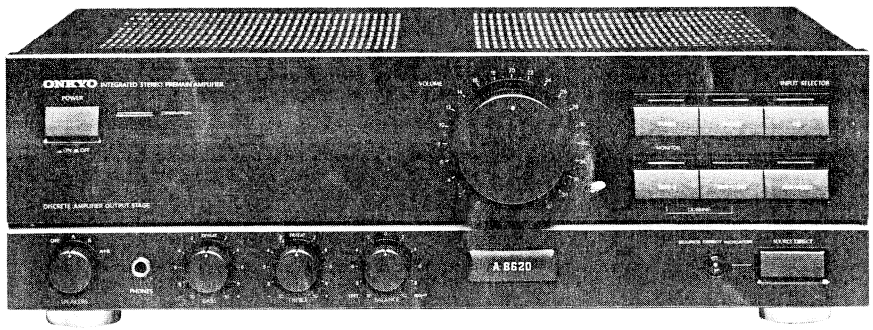
ONKYO® SERVICE MANUAL

Integrated Stereo Amplifier
MODEL A-8620



Silver and Black models

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

TABLE OF CONTENTS

Item	Page
Specifications	2
Precautions	2
Adjustment procedures	3
Chassis exploded view	4
Printed circuit board parts list	6
Parts list of packing	8
IC block diagram	9
Printed circuit board view	11
Schematic diagram	15
Block diagram	17

ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

Power Output:	40 watts per channel, min RMS, at 8 ohms, both channels driven from 20 Hz to 20 kHz, with no more than 0.08% THD. 2 × 65 watts at 4 ohms, 1 kHz (DIN) 2 × 50 watts at 8 ohms, 1 kHz (DIN)	
Total Harmonic Distortion:	0.08% at rated power	
IM Distortion:	0.08% at rated power	
Damping Factor:	40 at 8 ohms	
Frequencey and Response:	15–30,000 Hz ±1 dB	
Input Sensitivity/Impedance:	Phono:	2.5 mV/50 kohms
	Tuner/CD/AUX, Video:	150 mV/50 kohms
	Source Direct:	150 mV/50 kohms
	Tape/Play:	150 mV/50 kohms
Output Sensitivity/Impedance:	Tape/Rec:	150 mV/3 kohms (phono)
Phono Overload:	150 mV RMS at 1 kHz, 0.08% THD (REC)	
Bass Control:	±10 dB at 100 Hz	
Treble Control:	±10 dB at 10,000 Hz	
Selective Tone Control:	—	
Signal to Noise Ratio (IHF-A):	Phono:	80 dB (5 mV input)
	Source Direct (CD):	102 dB

General

Power Supply:	AC 220V, 50 Hz
Dimensions (W × H × D):	435 × 143 × 287 mm 17-1/8″ × 5-5/8″ × 11-5/16″
Weight:	6.3 kg, 13.9 lbs.

Specifications and features are subject to change without notice.

PRECAUTIONS

1. Replacing the fuses

For continued protection against risk fire, replace only with same type and same rating fuse.

CIRCUIT NO.	PART NO.	DESCRIPTION
F902	252076 or	3.15A-SE-EAK or
	252076CC	3.15A-SE-EAK Primary fuse

ADJUSTMENT PROCEDURES

Adjustments and Checking the Protection Circuitry

1. Preparations

1) Place the unit on the workbench. (There should be about 15 mm of space between the base plate of the unit and the work surface.)
2) Set up the unit as follows.
   (1) No load
   (2) No signal
   (3) Volume turned all the way down
   (4) Speaker switch OFF
   (5) Power switch OFF

Note) Check the following points before making adjustments
   (1) The power switch should be OFF.
   (2) The interior of the unit should not be warm.

2. Idling current adjustment

1) Turn the power switch ON and allow the unit to warm up for about 10 minutes.
   (1) Ajust R529 (R530) so that the voltage at test point VCT-ID on the NAAF-3547 circuit board is 7.5mV±2.5mV

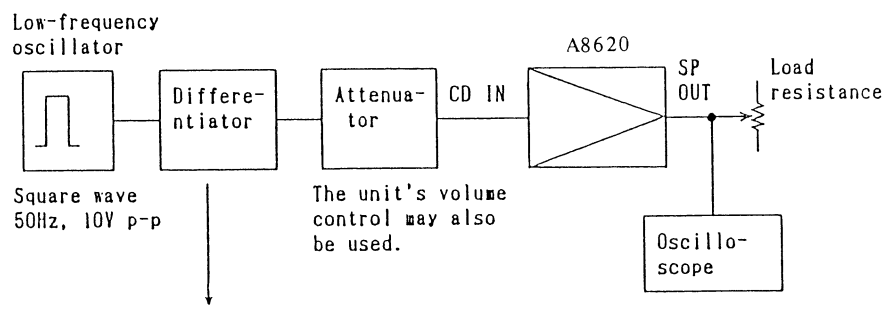
3. Check of operation of protection circuitry

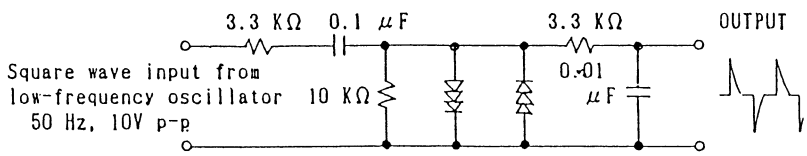
1) Check of operation of protection relay.
   (1) Confirm that the relay turns ON approximately 5 seconds after the power switch is turned ON.
   (2) The relay should turn OFF approximately 0.5 seconds after the power switch is turned OFF.
2) Check of DC detection
   (1) Turn the power on with no load.
   (2) After the speaker relay turns ON, apply DC +1.5V to the CD input terminals. Confirm that the relay turns OFF.
   (3) Confirm that operation is the same as (2) above when an input of DC −1.5V is applied.

Note) Under no circumstances connect a load or short the speaker terminals when performing the above test.

3) Signal input from the circuit illustrated below with no load.
   (1) Confirm that the speaker relay does not turn OFF even when a 2 ohm load is connected when a peak value of 35V p-p is output.
   (2) Next, confirm that when a 1 ohm load is connected the speaker relay switches OFF and ON a couple of times and then stays OFF.

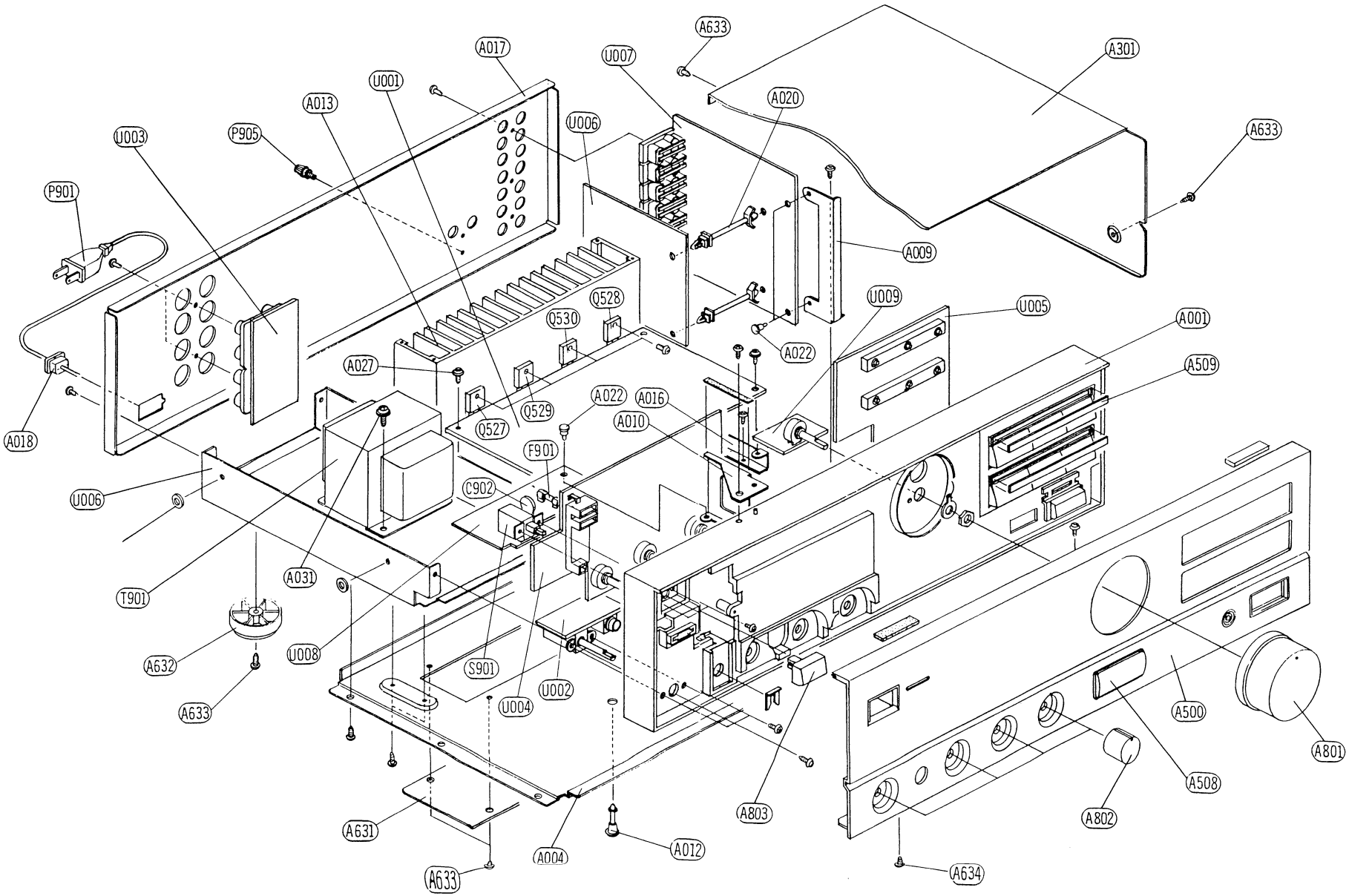
Note) The period before that relay stays OFF should not last for more than 10 second.
Relay OFF status can be canceled by switching the power OFF.





NOTE) Semi-fixed resistors enclosed in parentheses ( ) are for the right channel.

CHASSIS-EXPLODED VIEW



PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
A001	27110481B	FRONT ANGLE ASS'Y [BLACK]
A001	27110480C	FRONT ANGLE ASS'Y [SILVER]
A004	27100185A	CHASSIS
A006	27130573B	BRACKET (PT)
A009	27141329	BRACKET (SW)
A010	27141324	BRACKET (POW)
A013	27160238C	HEATSINK
A016	27141332	BRACKET (PC)
A017	27121242A	BACK PLATE
A018	27300750	BUSHING (CABLE)
A020	27190369	KGLS-22S, PC HOLDER
A021	27190511	KGLS-16R, PC HOLDER
A022	880009	NRP-345, REVET
A027	831130088	3TTW-8B, TAPPING SCREW
A031	830440089	4TTC+8CBC, TAPPING SCREW
A301	28184436	TOP COVER [BLACK]
A301	28184435	TOP COVER [SILVER]
A302	28140555	CUSHION
A303	28140729	CUSHION
A304	27270147	SPACER
A500	1A139121	FRONT PANEL [BLACK]
A500	1A142121	FRONT PANEL [SILVER]
(A502)	27267593	GUIDE (POW) [BLACK]
(A502)	27267592	GUIDE (POW) [SILVER]
(A503)	27267591	GUIDE (TONE) [BLACK]
(A503)	27267590	GUIDE (TONE) [SILVER]
(A504)	27267595	GUIDE (SD) [BLACK]
(A504)	27267594	GUIDE (SD) [SILVER]
(A505)	28198724	FACKET (OP)
(A506)	28198725	FACKET (SD)
A508	28135175	NAME PLATE [BLACK]
A508	28135174	NAME PLATE [SILVER]
A509	28191507	PLATE (SEL) [BLACK]
A509	28191515	PLATE (SEL) [SILVER]
A631	27170261	BOTTOM BOARD
A632	27175219	BOTTOM REG
A633	834430088	3TTS+8BBC, TAPPING SCREW
A634	833430080	3TTP+8PBC, TAPPING SCREW
A801	28323673	KNOB (VOL) [BLACK]
A801	28323672	KNOB (VOL) [SILVER]
A802	28323677A	KNOB (TONE) [BLACK]
A802	28323676A	KNOB (TONE) [SILVER]
A803	28323241-1	KNOB (POW) [BLACK]
A803	28323249-1	KNOB (POW) [SILVER]
Q527, Q528	2201783 or	2SC3854-O or
	2201784 or	2SC3854-Y or
	2201786	2SC3854-P, TRANSISTOR
Q529, Q530	2201773 or	2SA1490-O or
	2201774 or	2SA1490-Y or
	2201776	2SA1490-P, TRANSISTOR
T901	2300421	NPT-1031G, POWER TRANSFORMER
P901	253149	AS-CEE, POWER SUPPLY CABLE
P905	25060044	GROUND TERMINAL
S901	25035550	NPS-111-L512P, POWER SWITCH
C902	3500065A	0.01μF, AC400V/125V, CAPACITOR
F902	252074 or	2A-SE-EAK or
	252074CC	2A-SE-EAK, FUSE

REF. NO.	PART NO.	DESCRIPTION
U001	1A139547-1A	NAAF-3547-1A, MAIN CIRCUIT PC BOARD ASS'Y
U002	1A139548-1	NASW-3548-1, SPEAKER SWITCH PC BOARD ASS'Y
U003	1A139549-1A	NAETC-3549-1A, SPEAKER TERMINAL PC BOARD ASS'Y
U004	1A139550-1A	NADG-3550-1A, SYSTEM CONTROL CIRCUIT PC BOARD ASS'Y
U005	1A139551-1	NASW-3551-1, KEY SWITCH PC BOARD ASS'Y
U006	1A139552-1A	NAETC-3552-1A, EQUALIZER CIRCUIT PC BOARD ASS'Y
U007	1A139553-1A	NAAF-3553-1A, SELECTOR SWITCH CIRCUIT PC BOARD ASS'Y
U008	1A139554-1A	NAPS-3554-1A, POWER SWITCH CIRCUIT PC BOARD ASS'Y
U009	1A139555-1	NAETC-3555-1, VOLUME CONTROL CIRCUIT PC BOARD ASS'Y

NOTE [BLACK]: ONLY BLACK MODEL
[SILVER]: ONLY SILVER MODEL

NOTE: NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

PRINTED CIRCUIT BOARD PARTS LIST

MAIN CIRCUIT PC BOARD (NAAF-3547-1A) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q501, Q502	2212285 or	2SC2878-A or
	2212286	2SC2878-B
Q503~Q506	2211455 or	2SA1015-GR or
	2210803	2SA733-P
Q507, Q508	2211371 or	2SC2259-O-001 or
	2211372	2SC2259-O-002
Q509, Q510	2211732 or	2SC1845-F or
	2211733	2SC1845-E
Q511, Q512	2211255 or	2SC1815-GR or
	2210746	2SC945A-P
Q513, Q514	2211353 or	2SA949-O or
	2211354	2SA949-Y
Q515, Q516	2211633 or	2SC2229-O or
	2211634	2SC2229-Y
Q517, Q518	2211255 or	2SC1815-GR or
	2210746	2SC945A-P
Q523, Q524	2211653 or	2SC2235-O or
	2211654	2SC2235-Y
Q525, Q526	2211643 or	2SA965-O or
	2211644	2SA965-Y
Q531, Q532	2211732 or	2SC1845-F or
	2211733	2SC1845-E
Q652	2211792 or	2SA992-F or
	2211793	2SA992-E
Q653, Q654	2211732 or	2SC1845-F or
	2211733	2SC1845-E
Q655	2211255 or	2SC1815-GR or
	2212485	JC501-Q
Q913	2201404 or	2SD1406-GR or
	2201405	2SD1406-Y
	Diodes	
D501, D502	4000120	KB265, Varistor
D652	223163	1SS133
D911~D914	223897 or	P300DL or
	22380003	1N5402F
D917, D918	224151601 or	05AZ16X or
	224651601 or	HZ16EB1 or
	224451601	MTZ16A, Zener
D919	224150623 or	05AZ6.2Z or
	224650623 or	HZ6.2EB3 or
	224450623	MTZ6.2C, Zener
D931, D932	223880 or	GP101N4003 or
	223896	1N4003
D933	224150502 or	05AZ5.1Y or
	224650502 or	HZ5.1EB2 or
	224450502	MTZ5.1B, Zener
	Capacitors	
C501, C502	354741009	10 μF, 16V, Elect.
C503, C504	372121014	100 pF, 50V, Styrene
C505, C506, C653	354722219	220 μF, 6.3V, Elect.
C511, C512	354780229	2.2 μF, 50V, Elect.
C513, C514	372121024	1000 pF, 50V, Styrene
C529, C530	371124734	0.047 μF, 50V, Mylar
C533, C534		
C535, C536	354781019	100 μF, 50V, Elect.
C652	354780479	4.7 μF, 50V, Elect.
C911, C912	35042075	6800 μF, 50V, Elect.
C913, C914	354761019	100 μF, 35V, Elect.
C919, C921	354742219	220 μF, 16V, Elect.
C922	354782219	220 μF, 50V, Elect.
C923	354741019	100 μF, 16V, Elect.
C925	354722219	220 μF, 6.3V, Elect.
C931	354741009	10 μF, 16V, Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistors	
R527, R528	442522704	27 Ω, 1/2W, Metal oxide film
R529, R530	5210064	N06HR10KBD, Semi-fixed
R535, R536	442529104	91 Ω, 1/2W, Metal oxide film
R539, R540	442522714	270 Ω, 1/2W, Metal oxide film
R541~R544	442520224	2.2 Ω, 1/2W, Metal oxide film
R545, R546	441620104	1 Ω, 1W, Metal oxide film
R547~R550	4000063 or	0.47 Ω, 2W or
	4500009	0.47 Ω, 2W, Metal plate
R559, R560	442520824	8.2 Ω, 1/2W, Metal oxide film
R564, R565	442520224	2.2 Ω, 1/2W, Metal oxide film
R658	441626214	620 Ω, 1W, Metal oxide film
R912	441623314	330 Ω, 1W, Metal oxide film
R915, R916, R917	441623314	330 Ω, 1W, Metal oxide film
R918	441724714	470 Ω, 2W, Metal oxide film
R920	442523324	3.3 KΩ, 1/2W, Metal oxide film
R931	441621024	1.0 KΩ, 1W, Metal oxide film
R932	442521024	1.0 KΩ, 1/2W, Metal oxide film
	Relay	
RL501	25065134	NRL-2P5A-DC24V-07
	Jumper sockets	
JL302a, JL903a	25050267	NSCT-3P95
JL902a	25050270	NSCT-6P98
	Bracket	
	27141059	Ground

SPEAKER SWITCH PC BOARD (NASW-3548-1) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	Coils	
L571, L572	231001	S-1.3B
	Resistors	
R571, R572	442520564	5.6 Ω, 1/2W, Metal oxide film
R573, R574	441623914	390 Ω, 1W, Metal oxide film
	Switch	
S571	25030290	NRSF-144-25SS
	Stereo jack	
P572	25045164	HLJ-4317-01-3020

SPEAKER TERMINAL PC BOARD (NAETC-3549-1 A) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	Terminal	
P571	25060134	NTM-8PDMN-063

SYSTEM CONTROL CIRCUIT PC BOARD (NADG-3550-1A) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q301, Q321	22240050	μPC4570C
Q701	22240238 or	LC6520H-3956 or
	22240254	LC6520H-4030
	Transistors	
Q703, Q704	2211255 or	2SC1815-GR or
	2212485	JC501-Q

CIRCUIT NO.	PART NO.	DESCRIPTION
	Diodes	
D711	225137CG or	SEL2413ECG or
	225137DG or	SEL2413EDG or
	225137DY	SEL2413EDY, LED
D712	223163	1SS133
D714~D716		
	Osc. element	
X701	3010150	CST4.00MGW
	Capacitors	
C301, C302	354780229	2.2 μF, 50V, Elect.
C305, C306		
C307, C308	354780339	3.3 μF, 50V, Elect.
C325, C326	354780339	3.3 μF, 50V, Elect.
C327, C328	371122234	0.022 μF, 50V, Elect.
C331, C332		
C701	3000051	0.047 F, 5.5V, SUPER
C703	354780109	1.0 μF, 50V, Elect.
C705	354741009	10 μF, 16V, Elect.
	Resistors	
R315	5104228	N11RHC250KWT22Z, Variable
R321, (R322)	5104229	N14RHC100KWT22Z, Variable
R335, (R336)		
R701	49163473404	47 KΩ×4, Network
	Holder	
	27190701A	(LED, OP)

KEY SWITCH PC BOARD (NASW-3551-1) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	Diodes	
D704~D710	225137CG or	SEL2413ECG or
	225137DG or	SEL2413EDG or
	225137DY	SEL2413EDY, LED
	Switches	
S701~S707	25035548	NPS-111-S510
	Holders	
	27190702A	(LED, SEL)
	27190697	(LED, ST)

EQUALIZER CIRCUIT PC BOARD (NAETC-3552-1A) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q101, Q102	222570 or	NJM4560DX or
	22240191	NJM4565DD
	Capacitors	
C103, C104	372121814	180 pF, 50V, Styrene
C107, C108	354741009	10 μF, 16V, Elect.
C111, C112	354721019	100 μF, 6.3V, Elect.
C113, C114	371126224	6200 pF, 50V, Mylar
C115, C116	371121824	1800 pF, 50V, Mylar
C119, C120	354721019	100 μF, 6.3V, Elect.
C131, C132	354742219	220 μF, 16V, Elect.
	Terminal	
P101	25045211	NPJ-2PDBL91

SELECTOR SWITCH CIRCUIT PC BOARD (NAAF-3553-1A) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q201	22240079	LC7821
Q202	22240025	LC4966
	Transistors	
Q203, Q204	2212285 or	2SC2878-A or
	2212286	2SC2878-B
Q801, Q811	2211455 or	2SA1015-GR or
	2212495	JA101-Q
Q802, Q812	2211255 or	2SC1815-GR or
	2212485	JC501-Q
	Diodes	
D801	224150621 or	05AZ6.2X or
	224650621 or	HZ6.2EB1 or
	224450621	MTZ6.2A, Zener
	Capacitors	
C804	354780229	2.2 μF, 50V, Elect.
C805, C811	354780109	1 μF, 50V, Elect.
C806, C807	354744709	47 μF, 16V, Elect.
	Terminals	
P201	25045213	NPJ-6PDBL-92
P202, P203	25045171	NPJ-4PDBL-65

POWER SWITCH CIRCUIT PC BOARD (NAPS-3554-1A) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C902	3500065A	0.01 μF, AC400V/125V, IS
	Switch	
S901	25035550	NPS-111-L512P
	Terminal	
	25060092	NTM-1S33
	Fuse holder	
F902a	25050065	YSH4037

VOLUME CONTROL CIRCUIT PC BOARD (NAETC-3555-1) PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistors	
R351, (R352)	5104250A	N16RGM50KA30F, Variable

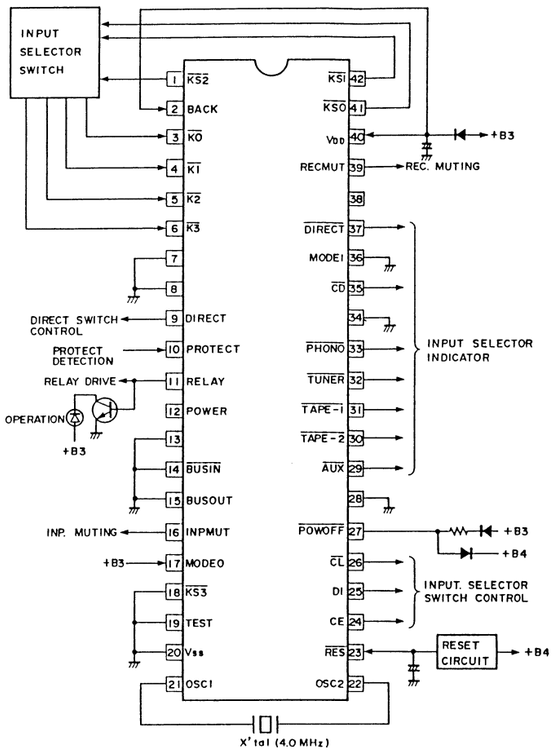
PARTS LIST OF PACKING

REF. NO.	PART NO.	DESCRIPTION
A851	29051882	MASTER CARTON BOX [BLACK]
A851	29051881	MASTER CARTON BOX [SILVER]
A852	29091322B	PAD, LEFT
A853	29091323B	PAD, RIGHT
A855	261504	W = 30 mm, PAPER TAPE
A866	29100063	750 × 580mm, POLY-VINYL BAG
A867	282301	SEALING HOOK
A868	260012	W = 50 mm, DAMPLON TAPE
	29355133	CAUTION (DBP)
A900	ACCESSARY BAG ASS'Y	
	29341395	INSTRUCTION MANUAL
	29365020A	WARRANTY CARD
	29100006A	250 × 350, POLY-VINYL BAG
	29100094A	POLY-VINYL BAG (WARRANTY CARD)

NOTE [BLACK]: ONLY BLACK MODEL
[SILVER]: ONLY SILVER MODEL

IC BLOCK DIAGRAM

LC6520H-3956

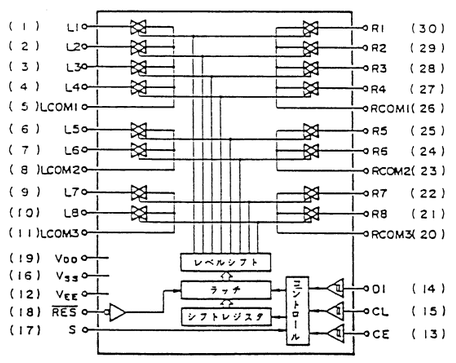


Pin No.	Pin name	Symbol	Function
1	PA2	$\overline{KS2}$	Key scan output terminal.
2	PA3	$\overline{BACK}$	Input terminal for initial settings. Fixed at "H".
3 4 5 6	PB0 PB1 PB2 PB3	$\overline{K0}$ $\overline{K1}$ $\overline{K2}$ $\overline{K3}$	Key input terminals.
7	PC0	—	Fixed at "L".
8	PC1	—	Fixed at "L".
9	PC2	DIRECT	DIRECT switch on is "H".
10	PC3	PROTECT	Protect input terminal.
11	PD0	RELAY	Speaker relay control terminal. Switches to "H" 5 second after power is turned on. Immediately switches to "L" when POW OFF terminal switches from "H" to "L".
12	PD1	POWER	Open terminal.
13	PD2	—	Ground
14	PD3	BUS-IN	Ground
15	PE0	$\overline{BUSOUT}$	Ground
16	PE1	INPUMT	Input selector muting output terminal.
17	PE2	MODEO	Fixed at "H". Initial setting when power is turned on.
18	PE3	$\overline{KS3}$	Ground
19	TEST	TEST	Ground
20	V_{SS}	V_{SS}	Ground
21 22	OSC1 OSC2	OSC1 OSC2	Ceramic oscillator connector terminals (4 MHz).

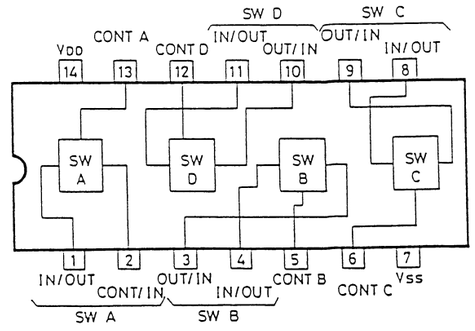
23	$\overline{RES}$	$\overline{RES}$	RESET input terminal.
24	PF0	CE	Chip-enable output terminal. Connected to analog switch CE terminal.
25	PF1	DI	Serial data output terminal. Connected to analog switch DI terminal.
26	PF2	$\overline{CL}$	Serial data output terminal. Connected to analog switch CL terminal.
27	PF3	$\overline{POWOFF}$	Power off sensor input terminal.
28	PG0	—	Ground
29 30 31 32 33 35	PG1 PG2 PG3 PI0 PI1 PI3	$\overline{AUX}$ $\overline{TAPE-2}$ $\overline{TAPE-1}$ $\overline{TUNER}$ $\overline{PHONO}$ $\overline{CD}$	INPUT SELECTOR display output terminals. Input selector setting position is "L".
34	PI2	—	Ground
36	PJO	MODE1	Power-on initial setting input terminal. Fixed at "L",
37	PJ1	$\overline{DIRECT}$	Direct display output terminal.
38	PJ2	—	Open terminal.
39	PJ3	RECMUT	Muting control output terminal for REC. output.
40	V_{DD}	V_{DD}	Power supply terminal (+5V).
41 42	PA0 PA1	$\overline{KS0}$ $\overline{KS1}$	Key scan output terminals.

NOTE: 1. The settings of the TAPE-1 REC and PLAY keys are always the reverse of one another. When one is on the other is off.
2. The TAPE-2 REC and PLAY keys work that same way as those of TAPE-1.
3. The analog switch settings do not change when the direct switch is turned on or off.

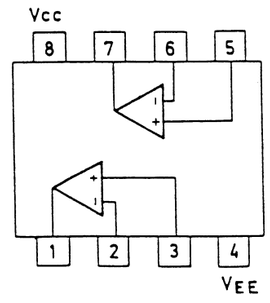
LC7821 (Analog switch)



LC4966 (Switch)

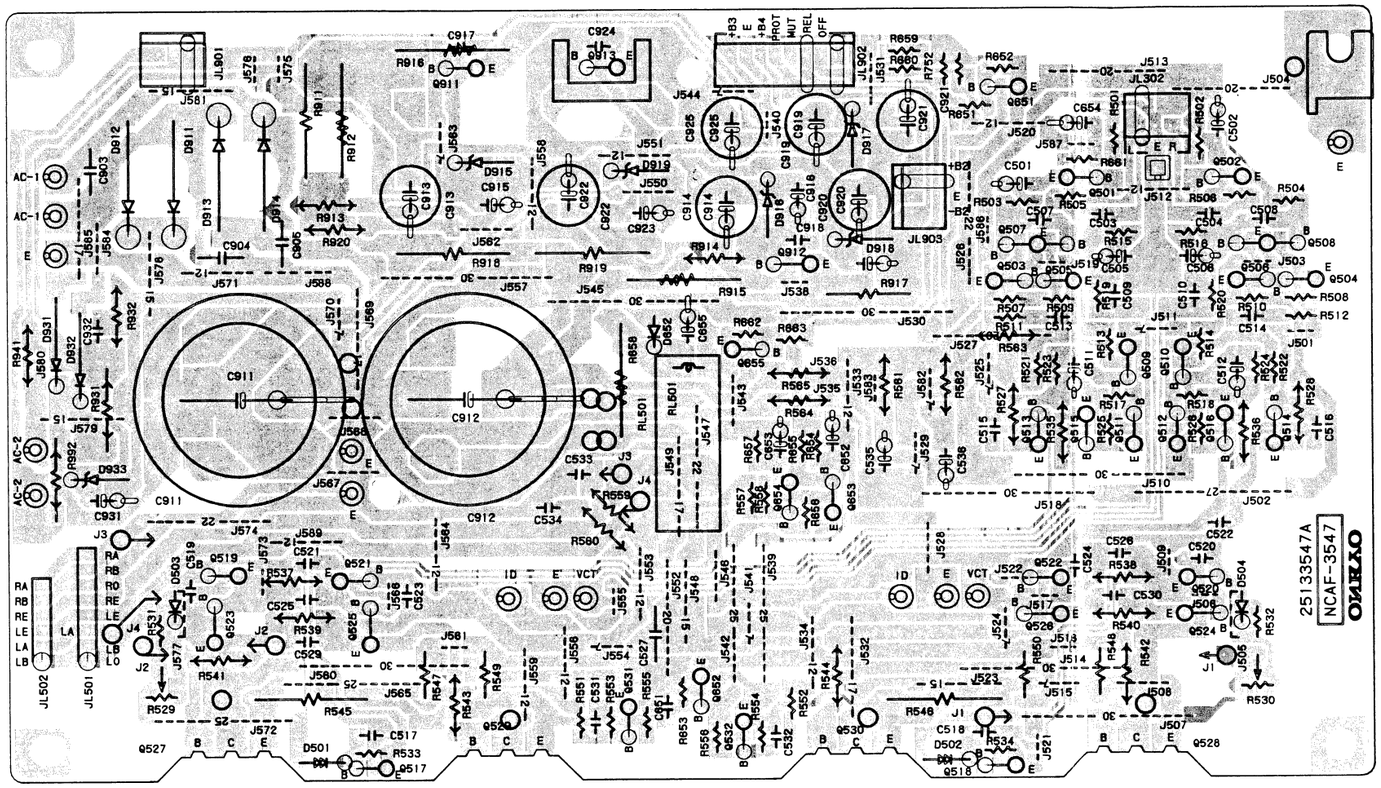


μPC4570C (OP. Amp.)
NJM4560DX
NJM4565DD

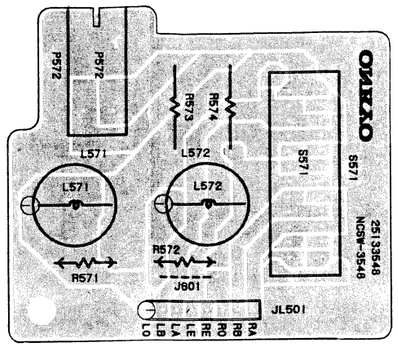


PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

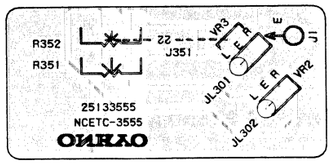
NASW-3547-1A



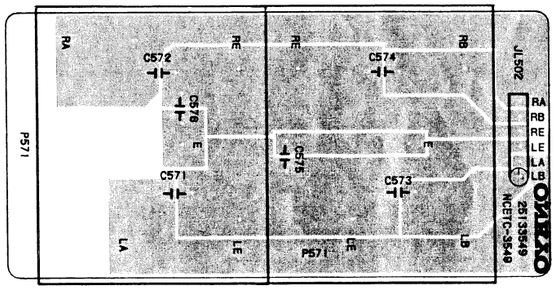
NASW-3548-1



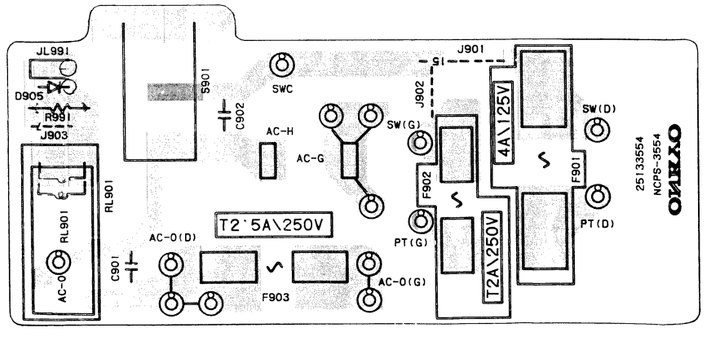
NAETC-3555-1



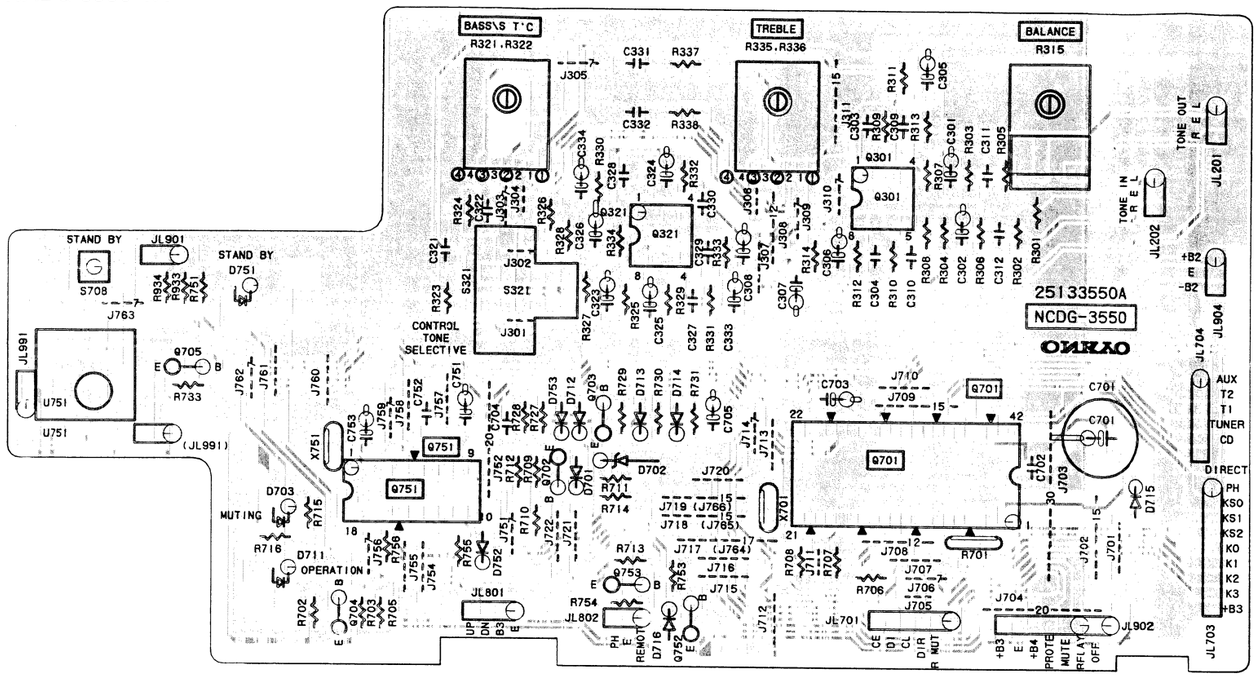
NASW-3549-1A



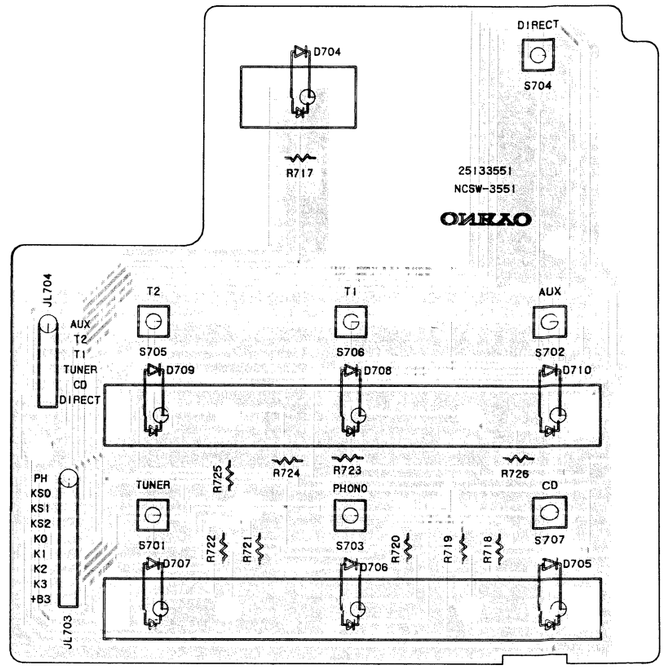
NAPS-3554-1A, 1B



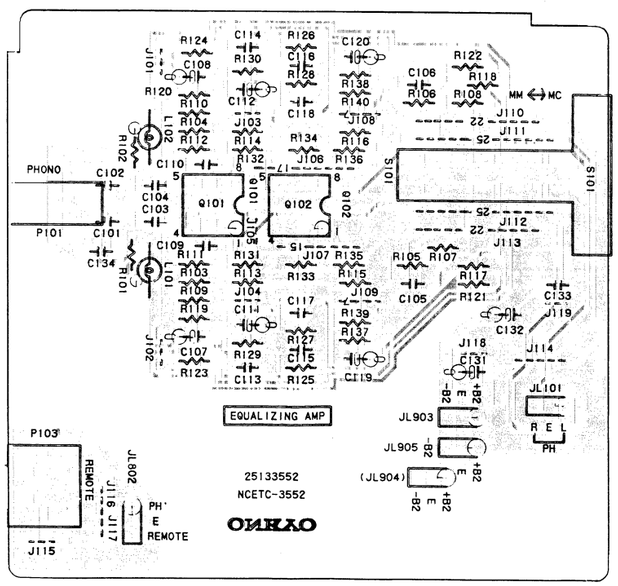
NADG-3550-1A



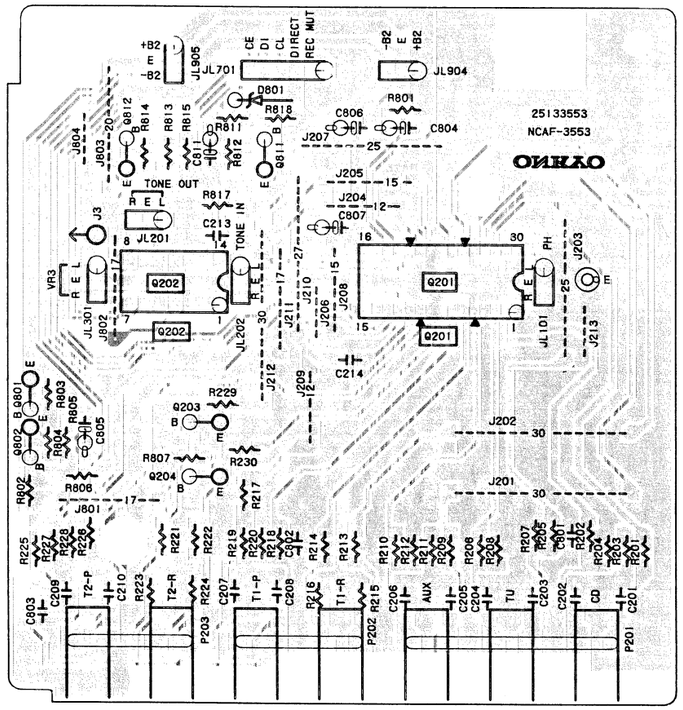
NASW-3551-1



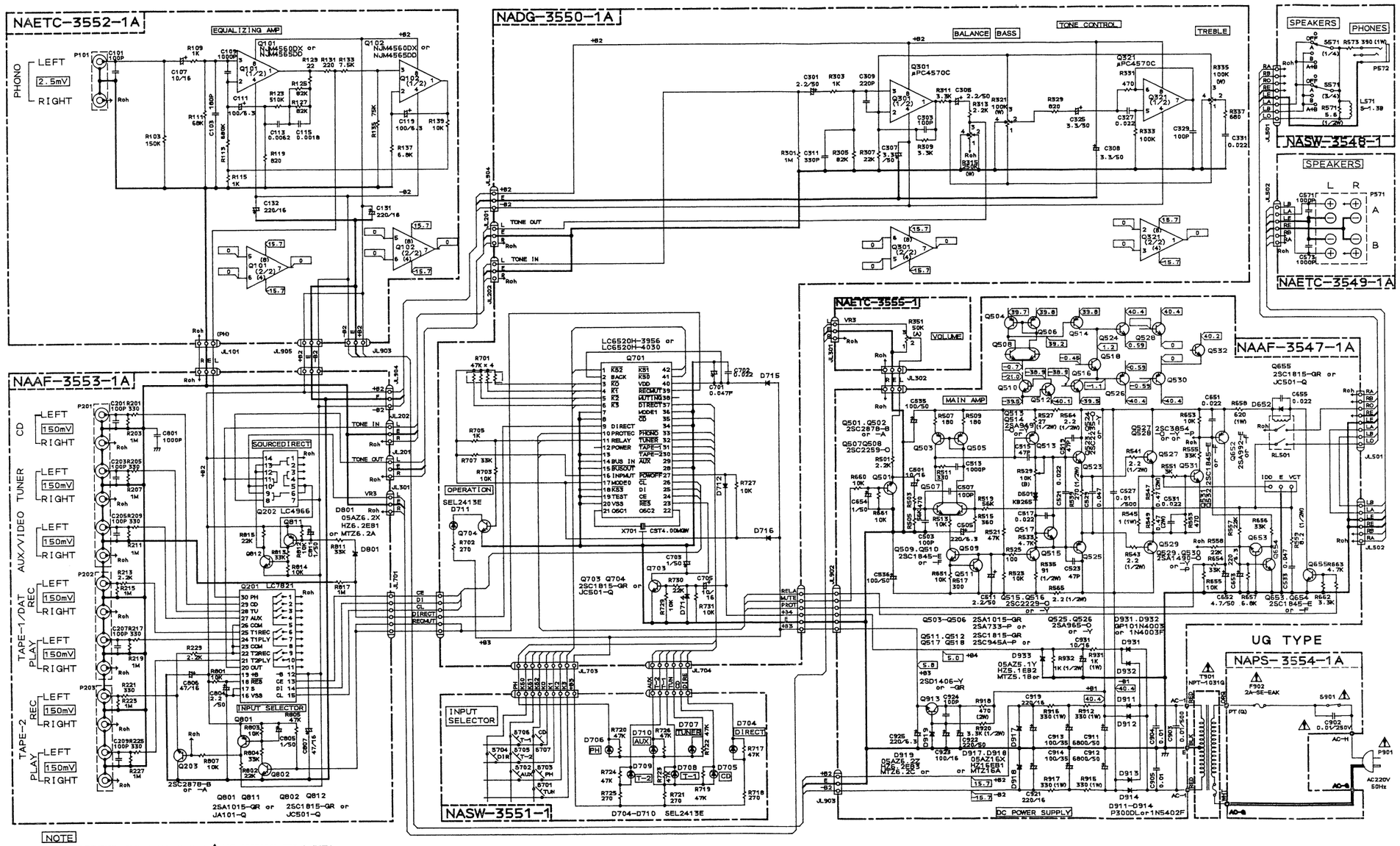
NAETC-3552-1A



NAAF-3553-1A

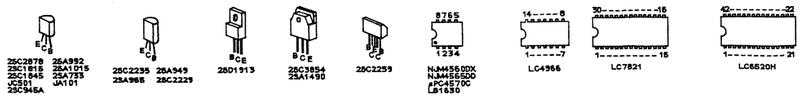


SCHEMATIC DIAGRAM



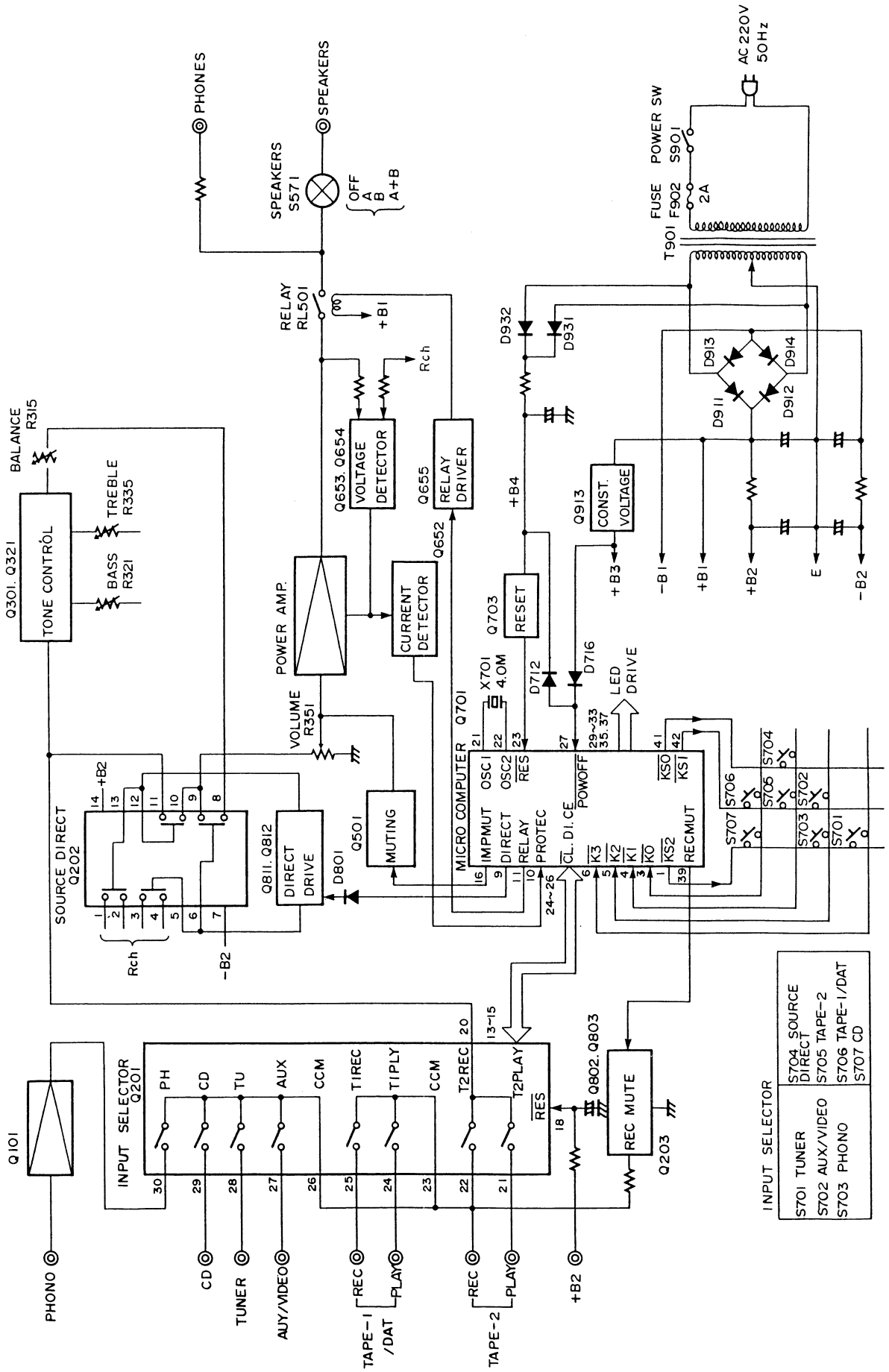
NOTE

1. THE COMPONENTS IDENTIFIED MY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
2. VOLTAGE (MEASURED WITH VT.VM.) ◁ V IS DC VOLTAGE. (NO INPUT SIGNAL)
3. ELECTROLYTIC CAPACITORS (◆) ARE IN μF/WV.
4. ALL CAPACITORS ARE IN μF/50WV UNLESS OTHERWISE NOTED.
5. ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
6. CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.
7. ALL DIODES ARE 1SS133 UNLESS OTHERWISE NOTED.



ONKYO CORPORATION

BLOCK DIAGRAM



ONKYO CORPORATION

International Division: No. 24 Mori Bldg., 23-5, Nishi-Shimbashi 3-chome, Minato-ku,
TOKYO 105, JAPAN Tel: 03-432-6987 Fax: 03-436-6979
ONKYO DEUTSCHLAND GmbH ELECTRONICS
Industriestrasse 18, 8034 Germering, WEST GERMANY
Telex: 41-521726 ONKY. Tel. 089-84-9320

0M3325 A902 Printed in Japan